

## ABSTRACT

A new type of polymer is described that represents a new composition of matter. This polymer contains alternating electronegative group III-VI elements connected with hydrocarbon or fluorocarbon linkages to form a polyalkyl or polyfluoroalkyl heteroatomic polymer. These polymers can be combined with lithium salts to form a solid polymer electrolyte for use in electrochemical systems such as batteries. These new solid polymer electrolytes exhibit lithium cation diffusion and lithium cation transport numbers that are superior to similar solid polymer electrolytes composed of polyethylene oxide.